

the Traffic Channel. Criteria for determining when to release the Traffic Channel include idle time (time since the last packet was sent or received), user priority, and mobility history (rapid succession of handoffs or signal fades).

Mobile stations can request assignment to a CDMA Traffic Channel by sending a CDMA *Origination Message* instead of a Paging/Packet Channel Request when initiating packet data service. Mobile stations can also establish their own criteria for making the transition between Traffic Channel and Packet/Paging Channels, so long as the resulting procedures do not conflict with the base station's procedures.

#### IV. CONCLUSION

The present invention provides the capacity to communicate data packets in a digital communication system over a random access channel. In CDMA systems, the invention uses Long Codes to encode the data packets and searchers that recognize the Long Codes for acquisition of packet data on the reverse link, permitting multiple users of the system to share random access channels. The present invention provides procedures for managing the searchers. As a result, many users who transmit infrequently and in small bursts can share the resources of the random access channel without the need to have a channel dedicated to each user for transmission of its data packets, thereby increasing efficiency in the system and reducing system and subscriber costs. The ability to track the location of mobile units communicating with the base station is also a feature of this invention.

Furthermore, the present invention provides means for switching or transitioning between the random access channel and a dedicated channel. The random access channel of the present invention is designed to handle bursty data transmissions. A dedicated channel, on the other hand, is dedicated to the user for the duration of its transmission sequence and is used, for example, when the user has a large amount of data to send or is transmitting continuously with little or no break between data transmissions. In accordance with the present invention, both types of channels may be provided as well as the ability to transition between them when conditions dictate. Threshold levels can be established for determining when to transition in either direction (i.e., from the random access channel to the dedicated channel and vice versa). When these threshold levels are met, the user is transitioned to the appropriate channel for transmission of data. In this way, the present invention keeps the random access channel open for bursty users, while providing users with large volume or continuous data a channel by which to communicate their data. Thus, the random access channel is not overburdened and rendered ineffective for its intended purpose.

The design of the random access channel may be different for the forward link and the reverse link. On the forward link, a Packet/Paging Channel is provided incorporating both a Packet Subchannel and a Paging Subchannel. This permits the base station to transmit packet data to a remote user. On the reverse link, a Reverse Packet Channel is provided that handles packet data from remote users so that the data can be sent to the base station.

The previous description of the preferred embodiments is provided to enable any person skilled in the art to make or use the present invention. The various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without the use of the inventive faculty. Thus, the present invention is not intended to be

limited to the embodiments shown herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein.

I claim:

1. In a digital communication system for communicating digital information, said digital communication system having a forward link and a reverse link, a system for communicating a data packet, comprising:

a communicating transceiver, from among a plurality of transceivers each having a different long code, for sending said data packet on a random access channel over said reverse link using said long code corresponding to said communicating transceiver, and for receiving said digital information from said forward link; and a base station for receiving said data packet on said random access channel from said reverse link and for sending said digital information over said forward link, said base station having a searcher which recognizes said data packet as being sent by the communicating transceiver based on said long code corresponding to said communicating transceiver;

wherein said plurality of transceivers share said random access channel and wherein said communicating transceiver requests reservation of said searcher.

2. The system recited in claim 1 wherein the digital communication system includes a broadcast channel for communicating paging and control messages over the forward link; and wherein the digital information is interleaved with said paging and control messages on said broadcast channel.

3. The system recited in claim 2 wherein the digital communication system is a CDMA communication system, and wherein the broadcast channel and a forward data packet channel are combined to obtain a Packet/Paging Channel on the forward link, said Packet/Paging Channel including a Packet Subchannel and a Paging Subchannel.

4. The system recited in claim 3 wherein the Packet/Paging Channel has a power control subchannel for controlling a power level of the data packet when the data packet is being received by the base station.

5. The system recited in claim 1, further comprising a dedicated channel for communicating the data packet.

6. The system recited in claim 5 wherein each of the plurality of digital transceivers has a bandwidth demand, the system further comprising a processor for switching from the random access channel to the dedicated channel when said bandwidth demand exceeds a first threshold level.

7. The system recited in claim 6 wherein the processor switches from the dedicated channel to the random access channel when the bandwidth demand drops below a second threshold level.

8. The system recited in claim 5 wherein the digital communication system is a cellular system having a network of individual cell sites and an active mobile transceiver from among the plurality of digital transceivers is communicating on the random access channel, the system further comprising a processor for switching said active mobile transceiver from the random access channel to the dedicated channel if said active mobile transceiver is undergoing a succession of handoffs between individual cell sites within said network of individual cell sites.

9. The system recited in claim 1 wherein the digital communication system includes a broadcast channel for communicating system information and an access channel for making access requests, said system information including paging messages;

wherein the communicating transceiver sends a searcher request message on said access channel and encodes